

431

Microbiology Team

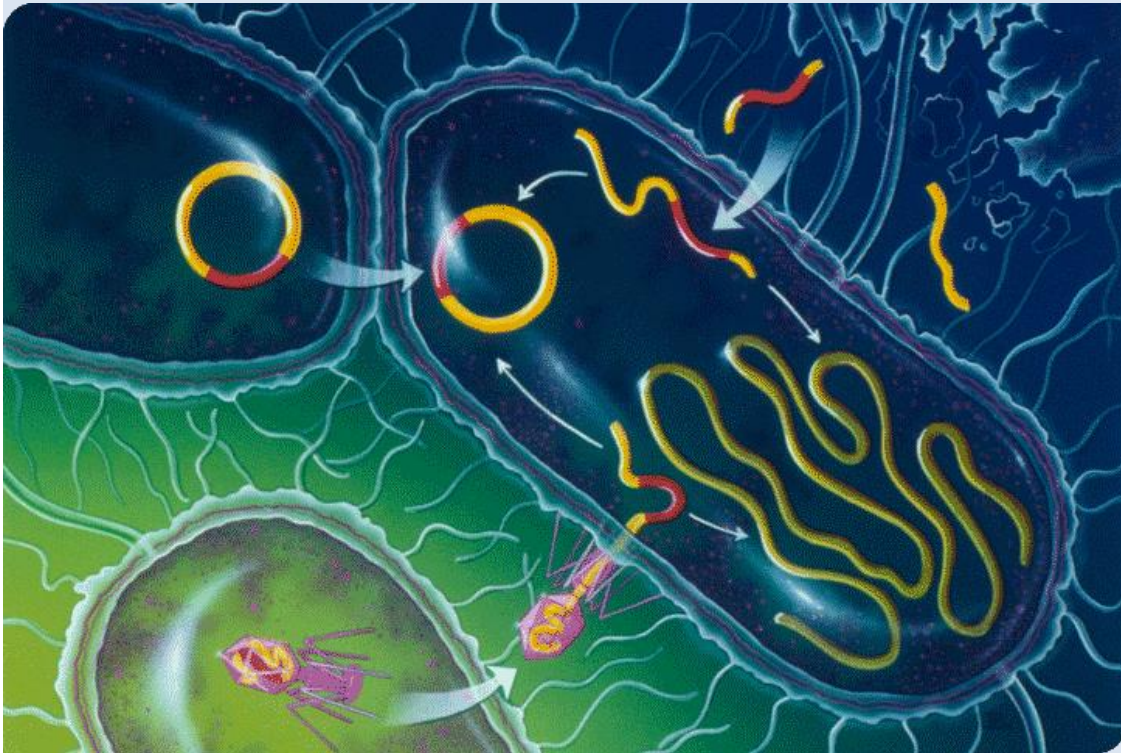
Candida + trichomonas vaginalis, bacterial vaginosis

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Vulvovaginitis, vulvitis, and vaginitis: Are general terms that refer to the inflammation of the vagina and/or vulva. (Vaginosis is alternation of normal flora caused by bacteria, vaginitis=inflammation by different organisms)

- **Lactobacilli:** is a **Normal flora** present in the vagina and the GIT. **Any changes in the vaginal acidity or disturb of the normal bacteria in the vagina may predispose to an infection,** (Normal flora of: Childhood: Staph and strept, Reproductive years: Lactobacilli, old: gram-ve)

Lactobacillus (cytolytic vaginitis) is one of the most under-diagnosed types of vaginitis. There is frequently a white discharge that may be mistaken for a yeast infection. Itching, irritation and burning of the vagina and vulva are frequent complaints. It is most often present during the 2 weeks before the onset of the menstrual period. Lactobacillus is one of the normal microorganisms found in the vagina, along with yeast. An imbalance in the vagina can result in overgrowth of this microorganism. The diagnosis is made by examination of the discharge under the microscope. Treatment is a baking soda douche which can be made with 2 ounces of baking soda in a quart of warm water. The douche is used every other night for a week and 1-2 times per week thereafter as needed. Placing 2-4 tablespoons of baking soda in 1-2 inches of bath water once or twice daily provides external relief of symptoms. You should also avoid external sources of lactobacilli such as yogurt, discontinue medication to treat yeast, and use non-deodorized pads during your menstrual period.

<i>Characteristics of the Vagina and Cervix in Women of Reproductive Age</i>		
	Vagina	Cervix
pH	<4.5	7.0
Epithelial cells	Squamous	Columnar
Pathogens/ Syndrome	Bacterial vaginosis Candida species Trichomonas vaginalis	Neisseria gonorrhoeae, Chlamydia trachomatis

Vaginosis/vaginitis:

- Most common reason for patient visit to OB/GYN.
- Three primary infections in order of prevalence:
 1. Bacterial vaginosis
 2. Candidiasis
 3. Trichomoniasis

Causes of vulvovaginitis:

- **Bacterial: Bacterial vaginosis (40%)**
(Most common)
- **Fungal: Candida vulvovaginitis (25%)**
- **Parasitic: trichomonal vulvovaginitis (25%)**
- Low estrogen levels (atrophic vaginitis)
- Allergic or irritation or injury response from spermicidal products, condoms, soaps, and bubble bath called "contact vulvovaginitis".

History:

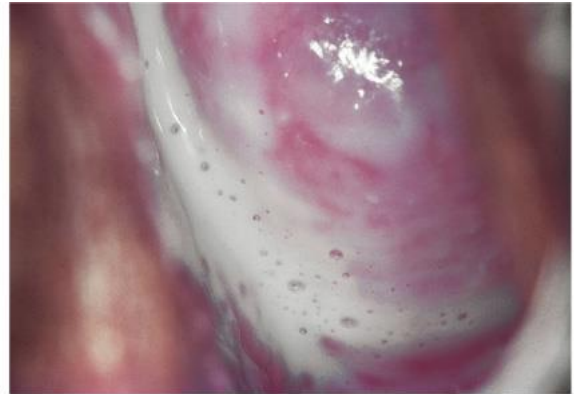
- General gynecological history
- Menstrual history
- Pregnancy
- Sexual Hx
- Contraception
- Sexual relationship
- Prior infection
- General medical Hx
 - Allergies
 - DM
 - Malignancies
 - Immunodeficiency
- Medication OCP, steroids, douches
- Symptoms

Bacterial Vaginosis

- **Most common** of vaginal syndromes and its due to change in the balance of normal vaginal bacteria (**Floral imbalance**) **[VERY IMPORTANT!!]**
- Very high numbers of bacteria such as: *Gardnerella vaginalis*, *Mycoplasma hominis*, *Bacteroides species*, and *Mobiluncus species* (Anaerobes suppressed normally by pH and Lactobacilli, if lactobacilli are low and anaerobes are more it will cause vaginosis)
- In contrast, *Lactobacillus bacteria* are in very low numbers or completely absent.

Clinical Features:

- Itching and burning.
- **Fishy-smelling** (especially after sexual intercourse and menses)
(foul smelling)
- Thin
(but large amount of secretion)
- **Milky-white** or **gray** vaginal discharge
(homogenous)



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Complications

Very IMP and serious because it may lead to infertility and affect the pregnancy outcome as complication

Obstetrics

- Preterm delivery
- Premature rupture of membranes
- Amniotic fluid infection
- Chorioamnionitis
(inflammation of the fetal membranes)
- Postpartum endometritis
(infection of the endometrium during pregnancy)
- Premature labor
- Low birth weight

GYN

- Pelvic inflammatory disease
(mostly by other organisms BV can also cause it)
- Postabortal pelvic inflammatory disease
- Posthysterectomy infections
- Mucopurulent cervicitis
- Endometritis
- Increased risk of HIV/STD

Diagnosis

- Related symptoms and sexual history.
- Examination of introitus may reveal erythema of the vulva and edema of the labia.
- Speculum examination (**a medical tool for investigating body cavities**).
- A sample of the **vaginal swab**.

Clinical Diagnosis

3 out of 4 of these criteria:

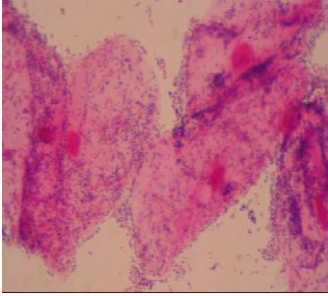
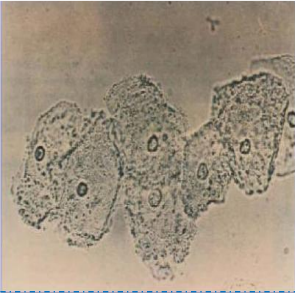
- **pH greater than 4.5.**
- Positive **Whiff test**.
- Any **clue cells**.
- Homogenous discharge.

Office Diagnostics for Vaginitis

- Empiric diagnoses often inaccurate and lead to incorrect treatment and management.
- Need for rapid, accurate and inexpensive diagnostic tests.

Office-based (Simple, inexpensive) tests for vaginitis are underutilized:

- Microscopy (**Gram stain**)(**Not culture**) - pH measurement - Whiff amine test

Gram Stain Diagnosis	PH TEST	KOH "WHIFF" TEST	WET MOUNT
<p>- Normal: Predominance of lactobacilli. (Big Gram+ve bacilli)</p> <p>- BV: Mixed small gram-positive and gram-negative rods ± curved rods.</p>  <p>BV: - Gram -ve coccobacilli: anaerobes caused bacterial vaginosis. - No lactobacilli are seen. Then score by Nugent score.</p>	<ul style="list-style-type: none"> ○ pH indicator strips: pH 3.5 - 7.0 ○ Place sample of vaginal secretion on test strip: read while still moist. ○ PH>4.5 indicates abnormality (i.e. BV-Trichomonas- or menstrual blood.) (But Candida has low pH) ○ Be careful not to sample the cervix; cervical secretions and blood have a PH 7.0. 	<ul style="list-style-type: none"> ○ Sample of vaginal secretions are placed in a test tube with 10% KOH. ○ KOH alkalizes amines produced by anaerobic bacteria-results in a sharp "fishy odor". <p>"Several drops of a (KOH) added to vaginal discharge to see whether a strong fishy odor is produced".</p>	<ul style="list-style-type: none"> ○ Vaginal secretion sample from the anterior fornix and lateral wall. ○ Place swab in test tube with small amount of normal saline and place sample on glass slide with cover slip. ○ Visualize at both low and high power. (Not done because it's hard to interrupt) ○ Clue cells (indicates BV), yeast, trichomonas, WBC, bacteria.  <p>Clue cells: epithelial cells coated with bacteria</p>

Tx: Metronidazole, Tinidazole

Candidiasis

- Overgrowth of a normal inhabitant of the vagina.
- Predisposing factors: Pregnancy , DM, Immunocompromized conditions, antibacterial treatment. (Low immunity predispose to C.glabrata which is resistant to Tx)

Clinical Presentation : Irritation, pruritis, soreness, **painful sexual intercourse burring on passing urine** and a **thick**, curdy, white (**like cottage cheese**) vaginal discharge. (little secretion, مع حبيبات)

Diagnosis of VVC (vulvovaginal Candidiasis):

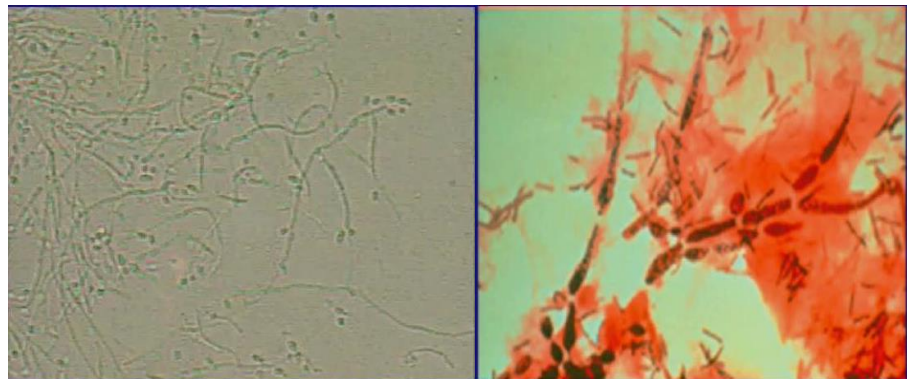
- **Wet prep**(mount) to see clumps of **pseudohyphae**.
- We do gram stain.
- Budding yeast and no pseudohyphae in patients with C.glabrata.
- KOH prep helpful but not always necessary.

Vaginal Yeast Cultures

- Probably not routinely indicated - many women are colonized with Candida.
- If obtained must correlate with patient signs and symptoms.
- **For recurrent infections culture and susceptibility testing may be helpful.** (in immunocompromized)

Tx: Oral azole: Fluconazole

Itraconazole



Yeast-Wet Prep

Candidiasis (Gram stain)

Trichomoniasis

- Sexually transmitted **parasite**
- Trichomonas is **the most prevalent non-viral sexually transmitted disease** (STD) agent.
(STD: Tx the husband, and if the patient is a sexually abused one, he/she may need counseling)
(Gonococcal Urethritis caused by N. gonorrhoea, Non-gonococcal urethritis was thought to be caused by chlamydia but recently it's shown that one possible cause is **Trichomoniasis Vaginalis**- the name is misleading it can happen to males also)

Clinical Features:

- Vaginal discharge, pruritis in females, but may be asymptomatic.
- Painful urination, Painful sexual intercourse
- **A yellow-green to gray**, sometimes **frothy**, vaginal discharge. (clotted filled with gases)
- **A malodorous smelling**
- **Males** usually asymptomatic, but can cause Non-gonococcal

Trichomonas Complications

- Premature rupture of membranes
- **Preterm labor and birth**
- Low birth weight
- **Increased transmission of other STDs including HIV** (Uncircumscised men are at higher risk for getting STDs due to increased contacted area with the vagina)

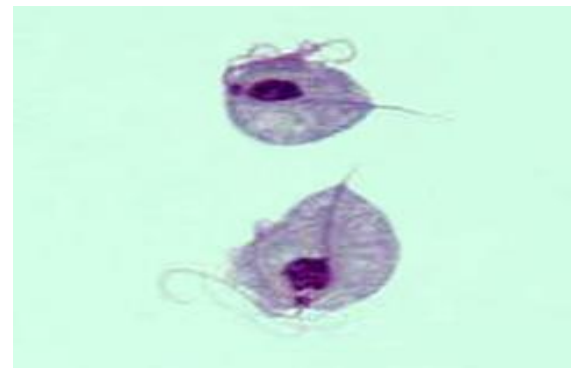
Diagnosis

- **Culture is considered the gold standard for the diagnosis of trichomoniasis. It's disadvantages include cost and prolonged time before diagnosis**
- **Trichomonas-Pap Smear**
- **Trichomonas Wet Prep** (In this case wet mount is helpful
Trichomonas are **motile** because it) (not used in our lab because when the sample arrives the **flagella** is already dead)

Other Methods of Diagnosis

- EIA (**ELISA**): Sensitivity 91.6% , Specificity 97.7%
- DNA Probe

Tx: Metronidazole , Tinidazole



Gram stain:

We see the **size**, smaller than epithelial cells and larger than pus cells)

Small from one side and larger from the other, with flagella.

Summary

Clinical syndrome	<u>Bacterial vaginosis</u>	<u>Candidiasis</u>	<u>Trichomoniasis</u>
General Info	<ul style="list-style-type: none"> ○ Most common of vaginal syndromes ○ caused by Floral imbalance ○ 	<ul style="list-style-type: none"> ○ Overgrowth of a normal inhabitant of the vagina ○ Predisposing factors: <u>Pregnancy , DM, Immunocompromized conditions, antibacterial treatment</u> 	<ul style="list-style-type: none"> ○ Sexually transmitted parasite ○ The most prevalent non-viral STD
Etiology	<p><i>Gardnerella vaginalis</i>, <i>Mycoplasma hominis</i>, <i>Bacteroides species</i>, and <i>Mobiluncus species</i></p>	<p>Candida albicans 80-90%, C.Glabrata, C.tropicalis</p>	<p>Trichomonas vaginalis</p>
Vaginal discharge	<ul style="list-style-type: none"> ○ Malodorous ○ Fishy-smelling ○ Milky-white to Gray ○ pH >4.5 	<ul style="list-style-type: none"> ○ Pruritus, thick cheesy ○ Irritation ○ Painful sexual intercourse ○ Burring on passing urine ○ pH <4.5 	<ul style="list-style-type: none"> ○ Copious(large amount) foamy discharge ○ A yellow-green to gray ○ Frothy (foamy) ○ A malodorous smelling ○ pH >4.5
Dx	<ul style="list-style-type: none"> ○ Gram staining the vaginal smear: (Mixed small gram-positive and gram-negative rods ± curved rods + No lactobacilli are seen) ○ pH measurement >4.5 ○ Whiff amine test: KOH alkalizes amines produced by anaerobic bacteria- results in a sharp "fishy odor". ○ Wet Mount to see clue cells but not usually done for BV 	<ul style="list-style-type: none"> ○ Gram staining the vaginal smear ○ Wet prep(mount) to see clumps of pseudohyphae. ○ For recurrent infections culture and susceptibility testing may be helpful. 	<ul style="list-style-type: none"> ○ Gram staining the vaginal smear ○ Trichomonas-Pap Smear ○ Trichomonas Wet Prep(mount) (flagellated motile)
Complications	<p>OB/GYN: Very IMP and serious because it may lead to infertility and affect the pregnancy outcome as complication</p>	-	<ul style="list-style-type: none"> ○ Increased transmission of other STDs including HIV ○ Preterm labor and birth
Tx	Metronidazole	Fluconazole orally	Metronidazole , and Tx the partner

Questions

- 1) A woman is complaining about a grey to white frothy malodorous vaginal discharge. On examining the vaginal discharge under the microscope, a motile organism was seen. Which of the following is the causative agent?
- a. *Candida*
 - b. *Trichomonas vaginalis*
 - c. *Neisseria gonorrhoeae*
 - d. *Gardnerella vaginalis*
- 2) A 35-year-old woman complains of vaginal discomfort for 2 weeks. Physical examination reveals a scanty vaginal discharge. The fluid develops a “fishy” odor after treatment with 10% potassium hydroxide. A Pap smear taken during the pelvic examination shows squamous cells covered by coccobacilli (“clue” cells). Which of the following is the most likely etiology of vaginal discomfort in this patient?
- a. *Chlamydia trachomatis*
 - b. *Gardnerella vaginalis*
 - c. *Herpes simplex virus*
 - d. *Human papillomavirus*
 - e. *Trichomonas vaginalis*
- 3) Patient present with milky-white or gray vaginal discharge, what is the sample you should send?
- a. *Blood*
 - b. *Urine*
 - c. *Smear – swab*
 - d. *Biopsy*
- 4) A patient came with frothy green vaginal discharge, and flagellated protozoan was found, what is the treatment?
- a. *Ceftriaxone*
 - b. *Metronidazole*
 - c. *Flucanazole*
 - d. *Vancomycin*

Answers: B,B,C,B

Courtesy of 430 Micro Team ... 